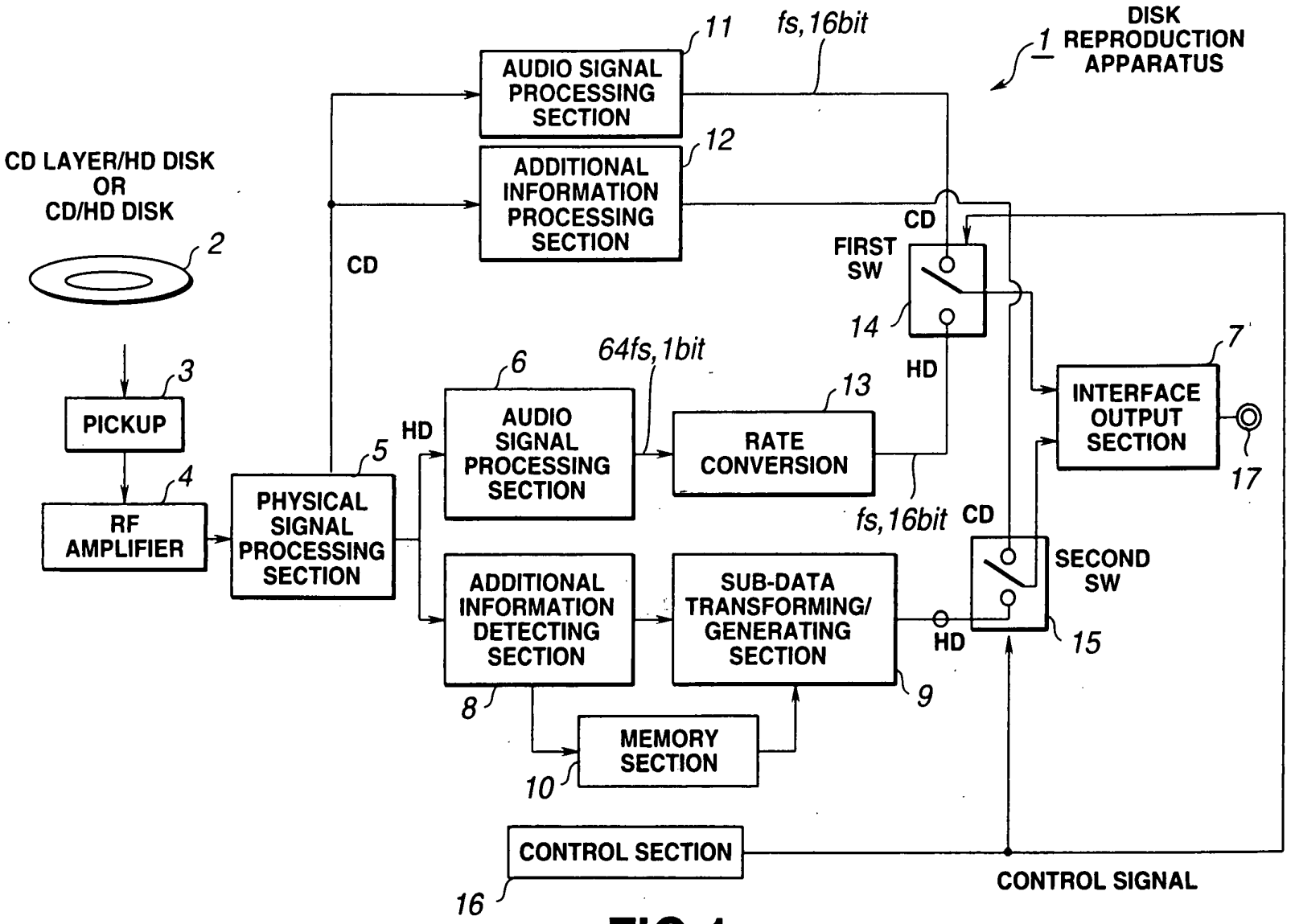

DISK REPRODUCTION APPARATUS
1
CD LAYER/HD DISK OR CD/HD DISK
2
PICKUP
3
RF AMPLIFIER
4
PHYSICAL SIGNAL PROCESSING SECTION
5
AUDIO SIGNAL PROCESSING SECTION
11
fs,16bit
ADDITIONAL INFORMATION PROCESSING SECTION
12
CD
HD
64fs,1bit
6
AUDIO SIGNAL PROCESSING SECTION
RATE CONVERSION
13
fs,16bit
FIRST SW
14
CD
HD
INTERFACE OUTPUT SECTION
7
17
SECOND SW
15
CD
HD
ADDITIONAL INFORMATION DETECTING SECTION
8
SUB-DATA TRANSFORMING/ GENERATING SECTION
9
MEMORY SECTION
10
CONTROL SECTION
16
CONTROL SIGNAL

FIG.1

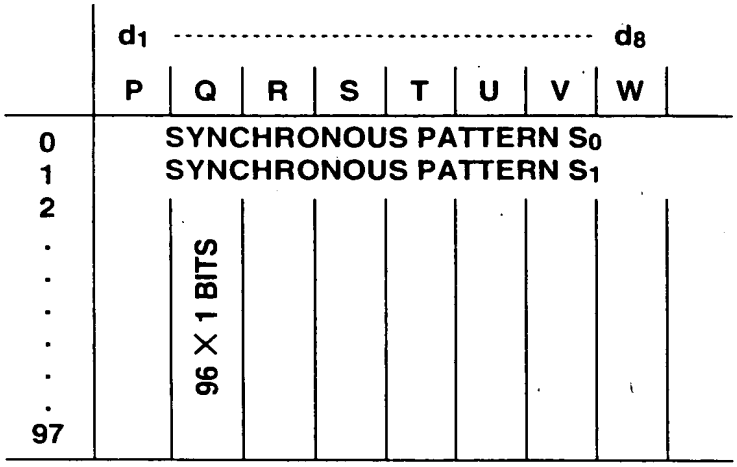

d1
d8
P
Q
R
S
T
U
V
W
0
1
2
97
SYNCHRONOUS PATTERN S0
SYNCHRONOUS PATTERN S1
96 X 1 BITS

FIG.2

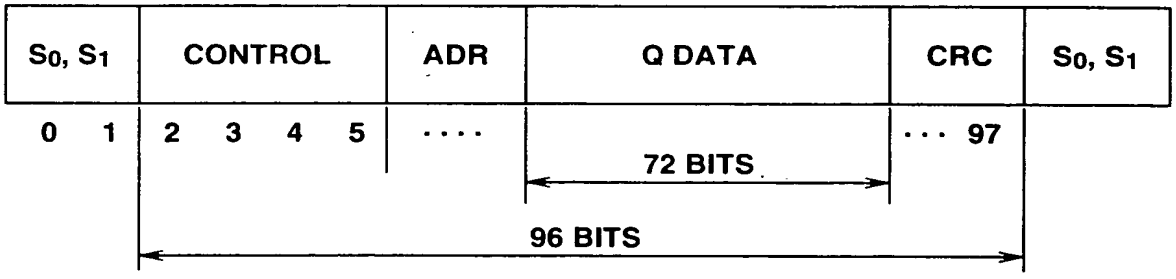

S0, S1
CONTROL
ADR
Q DATA
CRC
S0, S1
0 1
2 3 4 5
97
72 BITS
96 BITS

FIG.3

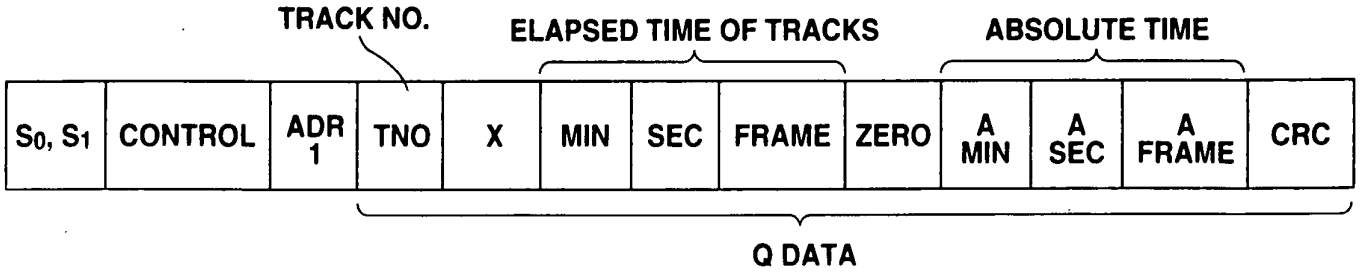

TRACK NO.
ELAPSED TIME OF TRACKS
ABSOLUTE TIME
S0, S1
CONTROL
ADR 1
TNO
X
MIN
SEC
FRAME
ZERO
A MIN
A SEC
A FRAME
CRC
Q DATA

FIG.4

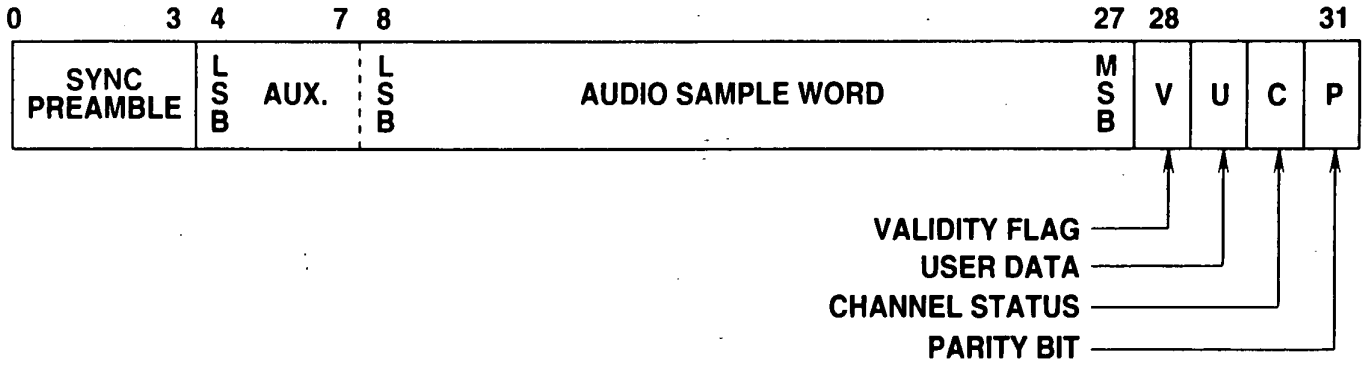

0
3
4
7
8
27
28
31
SYNC PREAMBLE
LSB
AUX.
LSB
AUDIO SAMPLE WORD
MSB
V
U
C
P
VALIDITY FLAG
USER DATA
CHANNEL STATUS
PARITY BIT

FIG.5

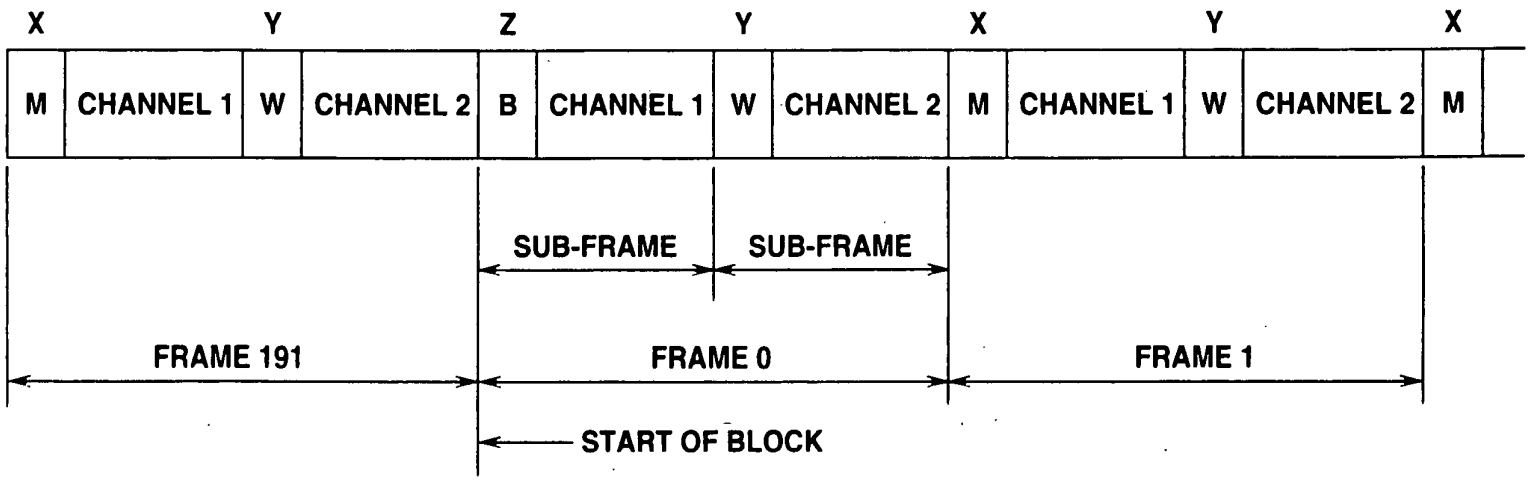

X
Y
Z
Y
X
Y
X
M
CHANNEL 1
W
CHANNEL 2
B
CHANNEL 1
W
CHANNEL 2
M
CHANNEL 1
W
CHANNEL 2
M
SUB-FRAME
SUB-FRAME
FRAME 191
FRAME 0
FRAME 1
START OF BLOCK

FIG.6

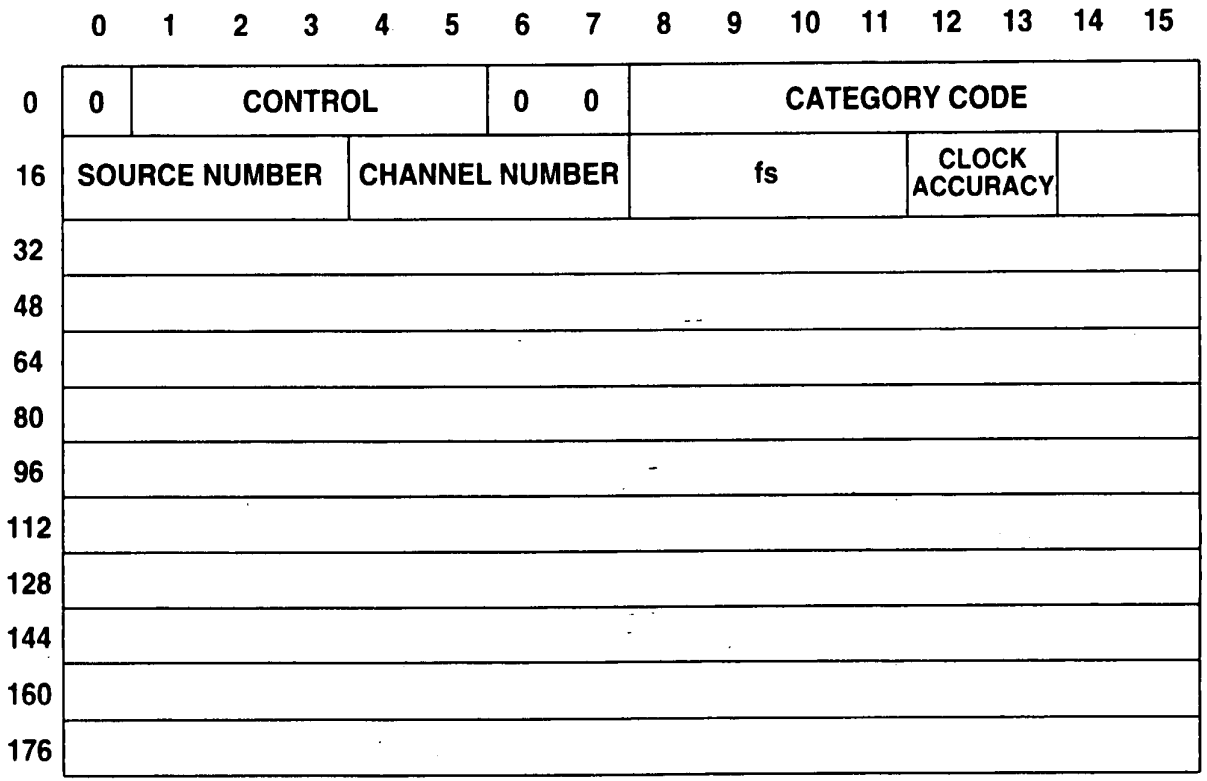

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
0
16
32
48
64
80
96
112
128
144
160
176
0
CONTROL
0 0
CATEGORY CODE
SOURCE NUMBER
CHANNEL NUMBER
fs
CLOCK ACCURACY

FIG.7

	0	1	2	3	4	5	6	7	8	9	10	11
0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
24	1	Q1	R1	S1	T1	U1	V1	W1	0	0	0	0
36	1	Q2	R2	S2	T2	U2	V2	W2	0	0	0	0
	.	.	.	.	.	.	.	.	.	.	.	.
1164	1	Q96	R96	S96	T96	U96	V96	W96	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
24	1	Q1	R1	S1	T1	U1	V1	W1	1	Q2	R2	S2
36	T2	U2	V2	W2	0	0	0	0	0	0	0	0
48	1	Q3	R3	S3	T3	U3	V3	W3	0	0	0	0
60	0	0	0	0	1	Q4	R4	S4	T4	U4	V4	W4
72	1	Q5	R5	S5	T5	U5	V5	W5	0	0	0	0
	.	.	.	.	.	.	.	.	.	.	.	.

FIG.8

No.	PREAMBLE SYNC	AUX	AUDIO SAMPLES				MSB	V	U	C	P
1	B	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C1L	P
2	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C1R	P
3	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C2L	P
4	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C2R	P
5	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C3L	P
6	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C3R	P
7	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C4L	P
8	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C4R	P
9	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C5L	P
10	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C5R	P
11	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C6L	P
12	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C6R	P
13	B	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C7L	P
14	B	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C7R	P
15	B	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C8L	P
16	B	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C8R	P
17	B	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C9L	P
18	B	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C9R	P
19	B	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C10L	P
20	B	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C10R	P
21	B	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C11L	P
22	B	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C11R	P
23	B	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C12L	P
24	B	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C12R	P

FIG.9

No.	PREAMBLE SYNC	AUX	AUDIO SAMPLES				MSB	V	U	C	P
25	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	1	C13L	P
26	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	Q1	C13R	P
27	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	R1	C14L	P
28	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	S1	C14R	P
29	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	T1	C15L	P
30	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	U1	C15R	P
31	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	V1	C16L	P
32	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	W1	C16R	P
33	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C17L	P
34	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C17R	P
35	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C18L	P
36	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C18R	P
37	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	1	C19L	P
38	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	Q2	C19R	P
39	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	R2	C20L	P
40	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	S2	C20R	P
41	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	T2	C21L	P
42	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	U2	C21R	P
43	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	V2	C22L	P
44	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	W2	C22R	P
45	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C23L	P
46	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C23R	P
47	M	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C24L	P
48	W	0000	0000	XXXX	XXXX	XXXX	XXXX	0	0	C24R	P

FIG.10

FIG.11A

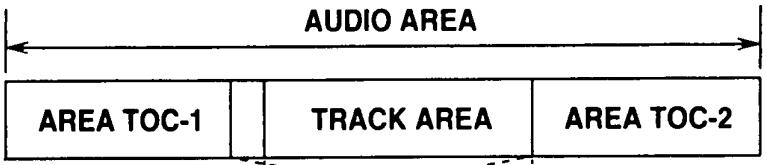


FIG.11B

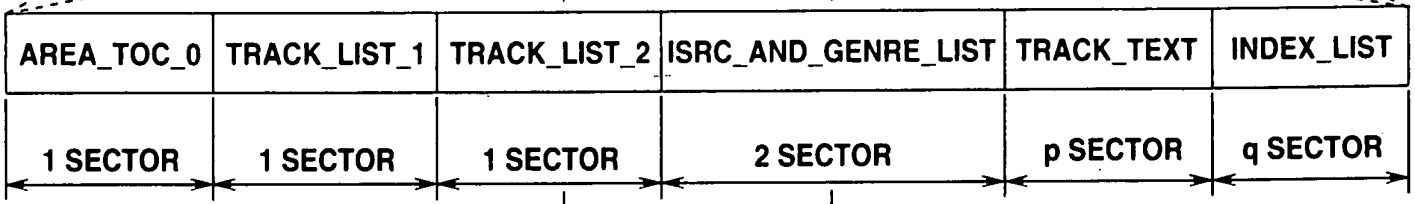


FIG.11C

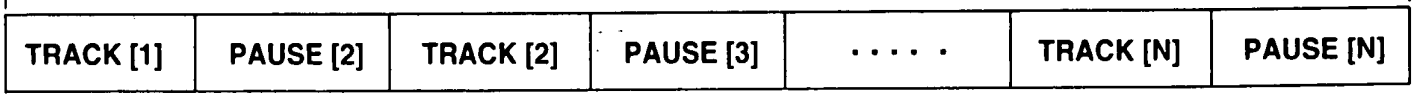
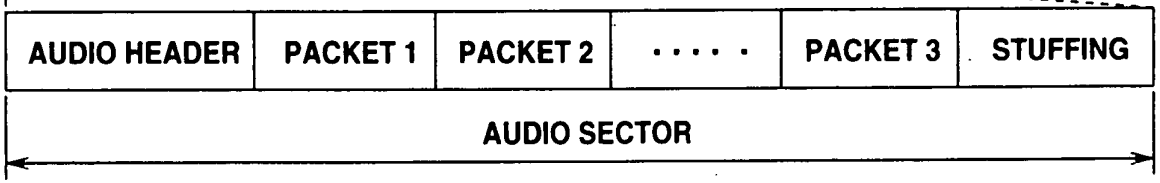
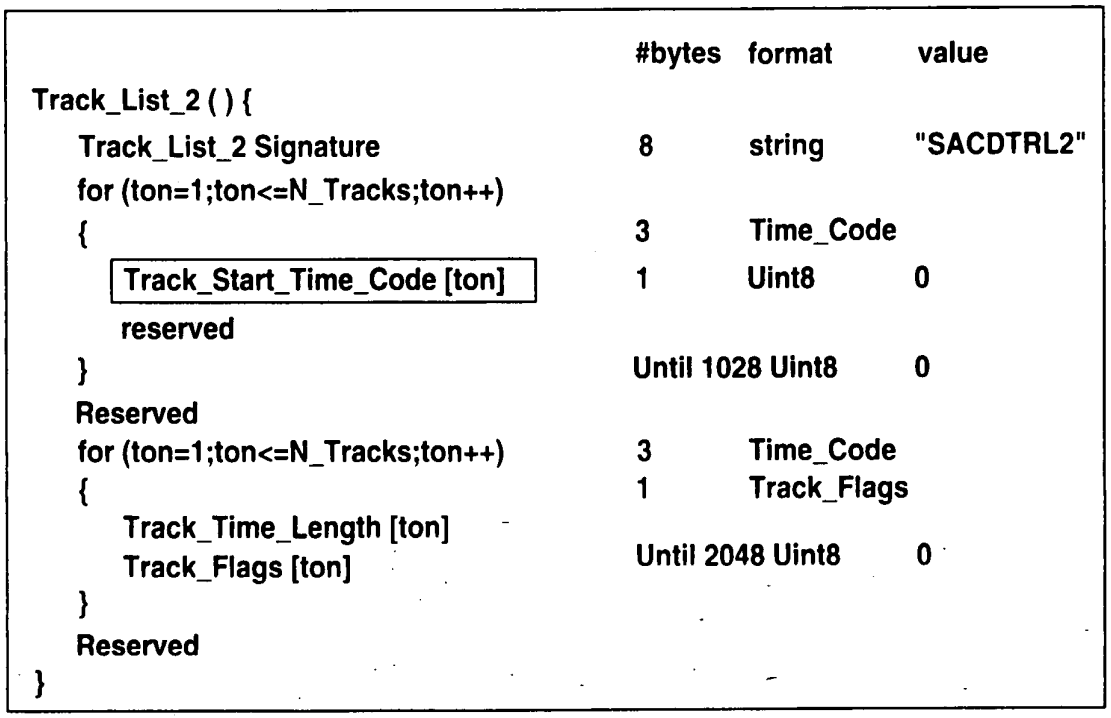


FIG.11D





	#bytes	format	value
Track_List_2 ( ) {			
Track_List_2 Signature	8	string	"SACDTRL2"
for (ton=1;ton<=N_Tracks;ton++)			
{	3	Time_Code	
Track_Start_Time_Code [ton]	1	Uint8	0
reserved	Until 1028	Uint8	0
}			
Reserved			
for (ton=1;ton<=N_Tracks;ton++)	3	Time_Code	
{	1	Track_Flags	
Track_Time_Length [ton]			
Track_Flags [ton]	Until 2048	Uint8	0
}			
Reserved			
}			

FIG.12

	#bytes	format	value
Index_List ( ) {			
Index_List_Signature	8	string	"SACD_Ind"
for (ton=1;ton<=N_Tracks;ton++)			
{			
Index_Ptr [ton]	2	Uint16	
}			
Reserved	Until 524	Uint8	0
for (ton=1;ton<=N_Tracks;ton++)			
if (Index_Ptr [ton]>0)			
{	1	Uint8	1..255
N_Stored_Indexes [ton]			
for (x=1;x<=N_Stored_Indexes [ton];x++)			
{	3	Time_Code	
Index_Start_TC [ton] [x+1]			
}	Until eos	Uint8	0
}			
Reserved			
}			

FIG.13

	#bytes	format	value
Audio_Header ( ) {			
N_Packs	3	Uint3	1..7
N_Frame_Starts	3	Uint3	1..7
Reserved	2		0
for (p=1;p<=N_Packets;p++)			
Packet_Info ( ) [p]	16	Packet_Info	
for (f=1;f<=N_Frame_Starts;f++)			
Frame_Info ( ) [f]	48	Frame/Info	
}			

FIG.14

	#bytes	format	value
Frame_Info ( ) [f] {			
Time_Code	24	Time_Code	
if (Frame_Format==0/*==LLC*/)			
{			
Reserved	2	Uint8	0
N/Sector [f]	4	Uint4	0
Buffer_Occupancy [f]	18	Uint18	0
}			
}			

FIG.15

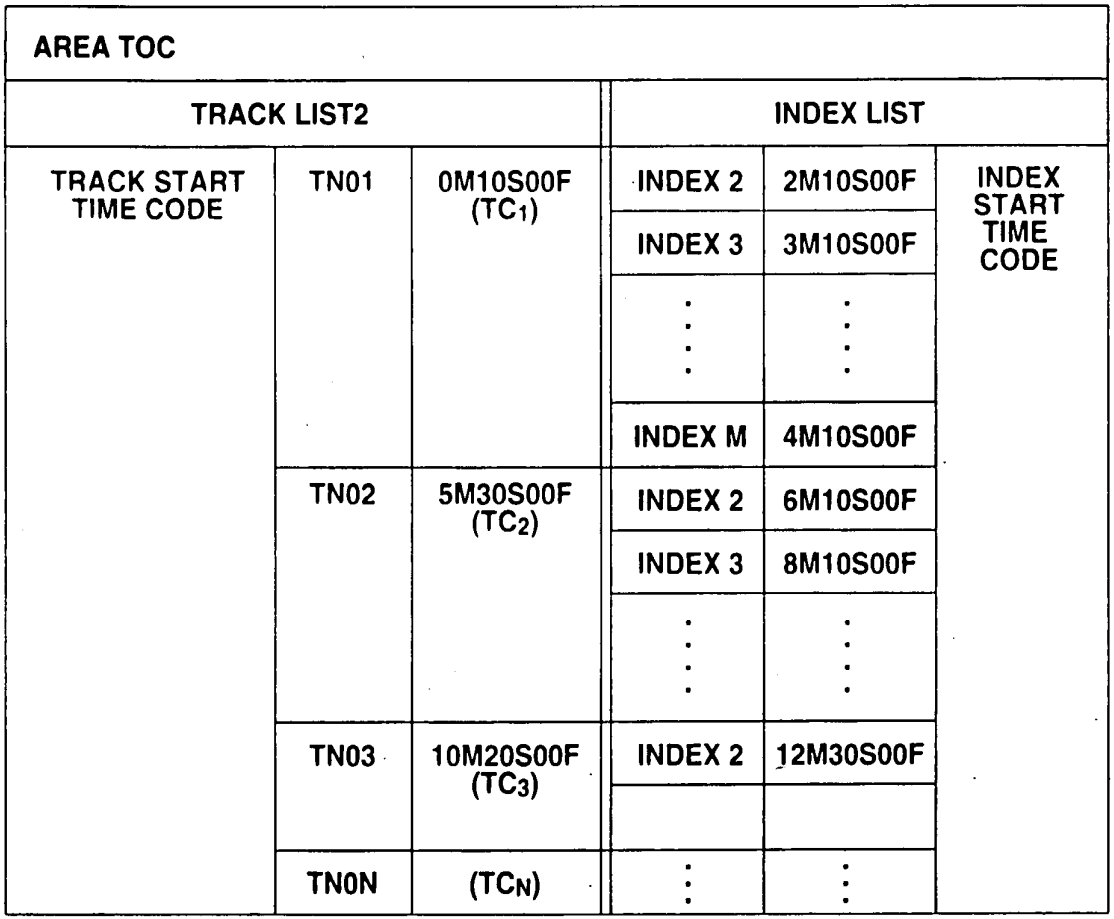

AREA TOC
TRACK LIST2
INDEX LIST
TRACK START TIME CODE
TN01
0M10S00F (TC1)
INDEX 2
2M10S00F
INDEX START TIME CODE
INDEX 3
3M10S00F
INDEX M
4M10S00F
TN02
5M30S00F (TC2)
INDEX 2
6M10S00F
INDEX 3
8M10S00F
TN03
10M20S00F (TC3)
INDEX 2
12M30S00F
TN0N
(TCN)

FIG.16

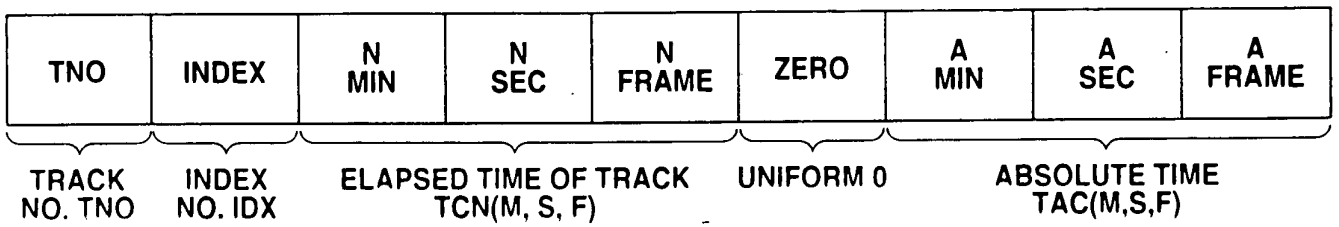

TNO
INDEX
N MIN
N SEC
N FRAME
ZERO
A MIN
A SEC
A FRAME
TRACK NO. TNO
INDEX NO. IDX
ELAPSED TIME OF TRACK TCN(M, S, F)
UNIFORM 0
ABSOLUTE TIME TAC(M,S,F)

FIG.17

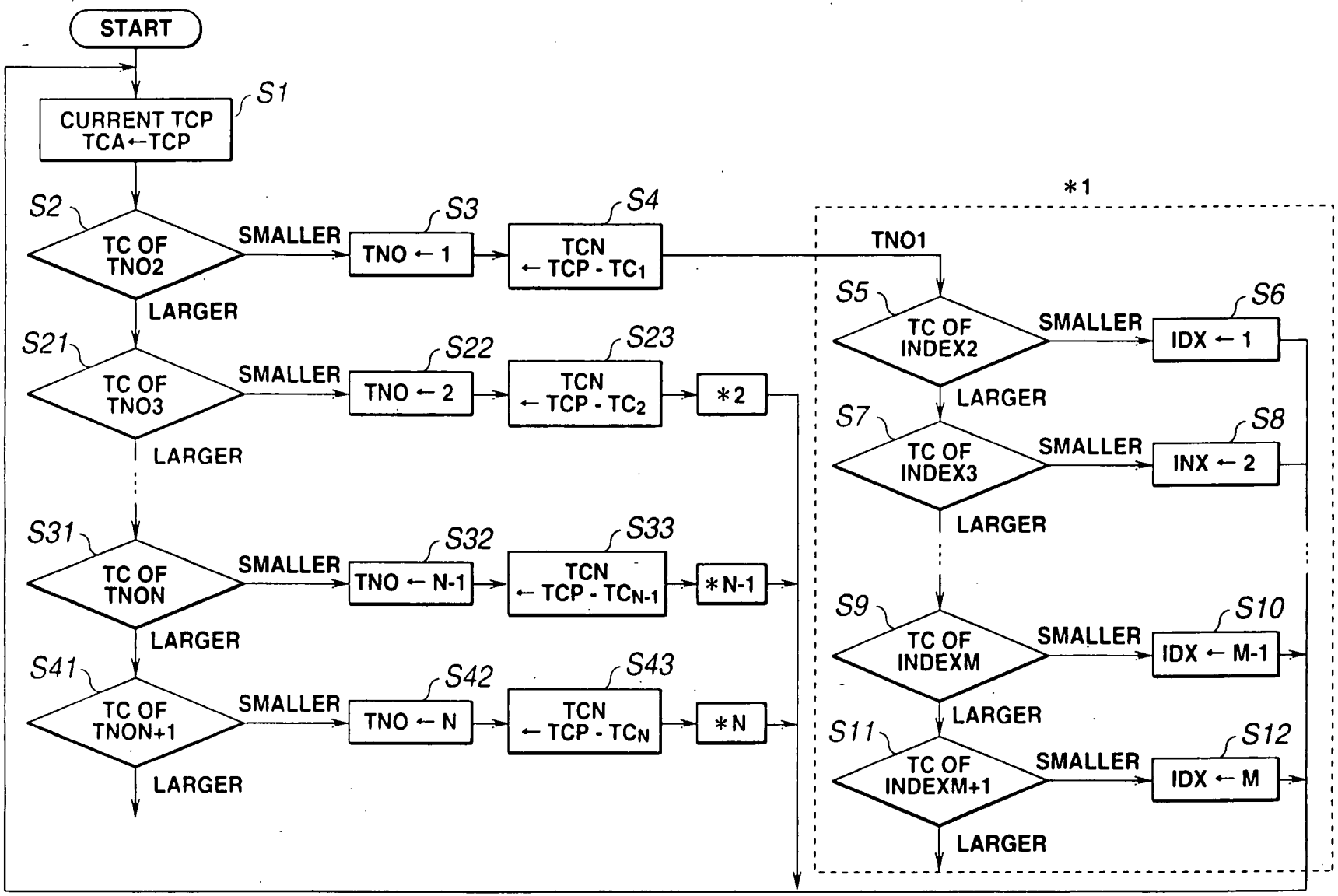

START
CURRENT TCP
TCA←TCP
S1
S2
TC OF
TNO2
SMALLER
S3
TNO ← 1
S4
TCN
← TCP - TC1
LARGER
S21
TC OF
TNO3
SMALLER
S22
TNO ← 2
S23
TCN
← TCP - TC2
*2
LARGER
S31
TC OF
TNON
SMALLER
S32
TNO ← N-1
S33
TCN
← TCP - TCN-1
*N-1
LARGER
S41
TC OF
TNON+1
SMALLER
S42
TNO ← N
S43
TCN
← TCP - TCN
*N
LARGER
*1
TNO1
S5
TC OF
INDEX2
SMALLER
S6
IDX ← 1
LARGER
S7
TC OF
INDEX3
SMALLER
S8
INX ← 2
LARGER
S9
TC OF
INDEXM
SMALLER
S10
IDX ← M-1
LARGER
S11
TC OF
INDEXM+1
SMALLER
S12
IDX ← M
LARGER

FIG.18

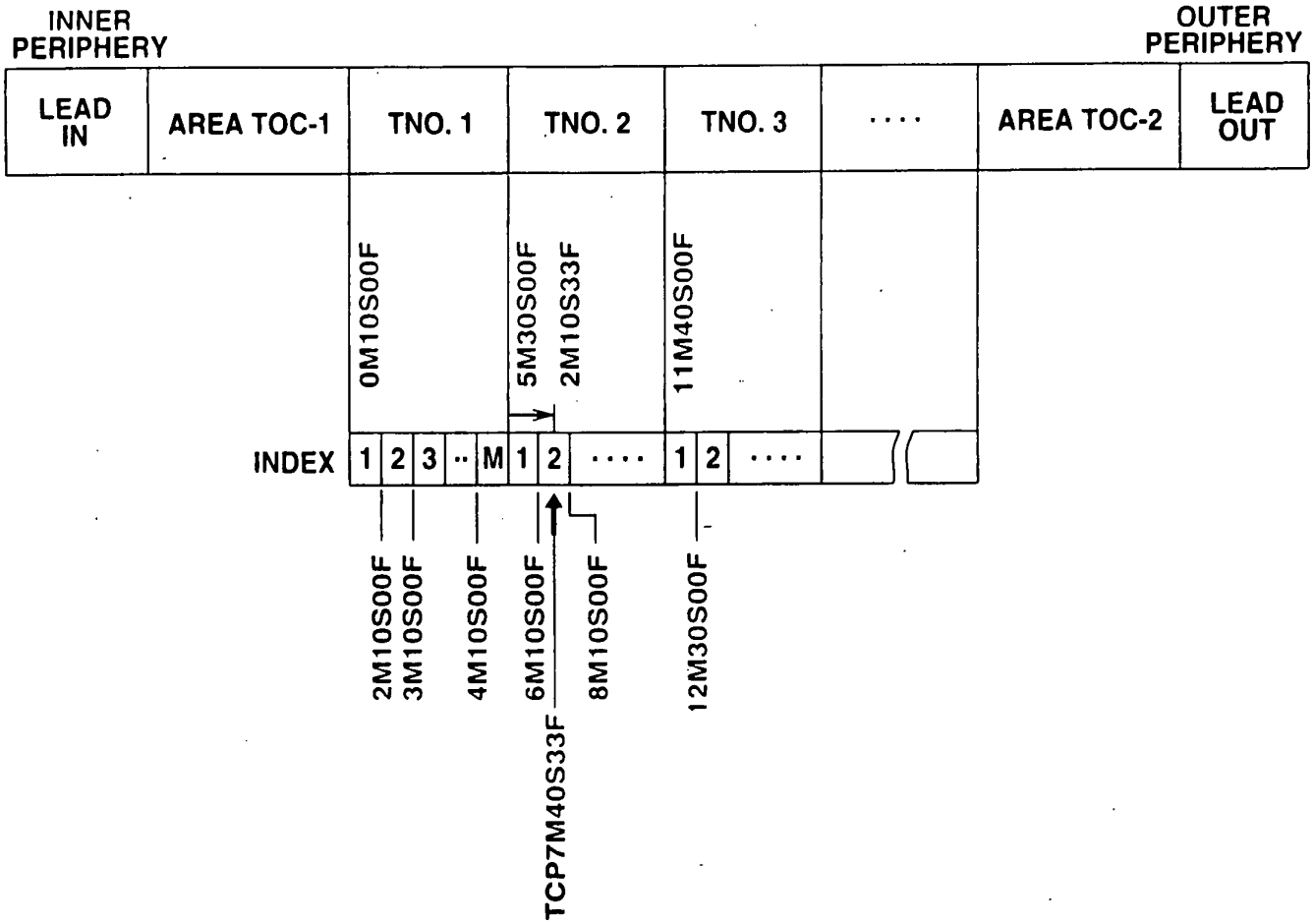

INNER PERIPHERY
OUTER PERIPHERY
LEAD IN
AREA TOC-1
TNO. 1
TNO. 2
TNO. 3
· · · ·
AREA TOC-2
LEAD OUT
0M10S00F
5M30S00F
2M10S33F
11M40S00F
INDEX
1 2 3 ·· M 1 2 · · · · 1 2 · · · ·
2M10S00F
3M10S00F
4M10S00F
6M10S00F
8M10S00F
12M30S00F
TCP7M40S33F

FIG.19

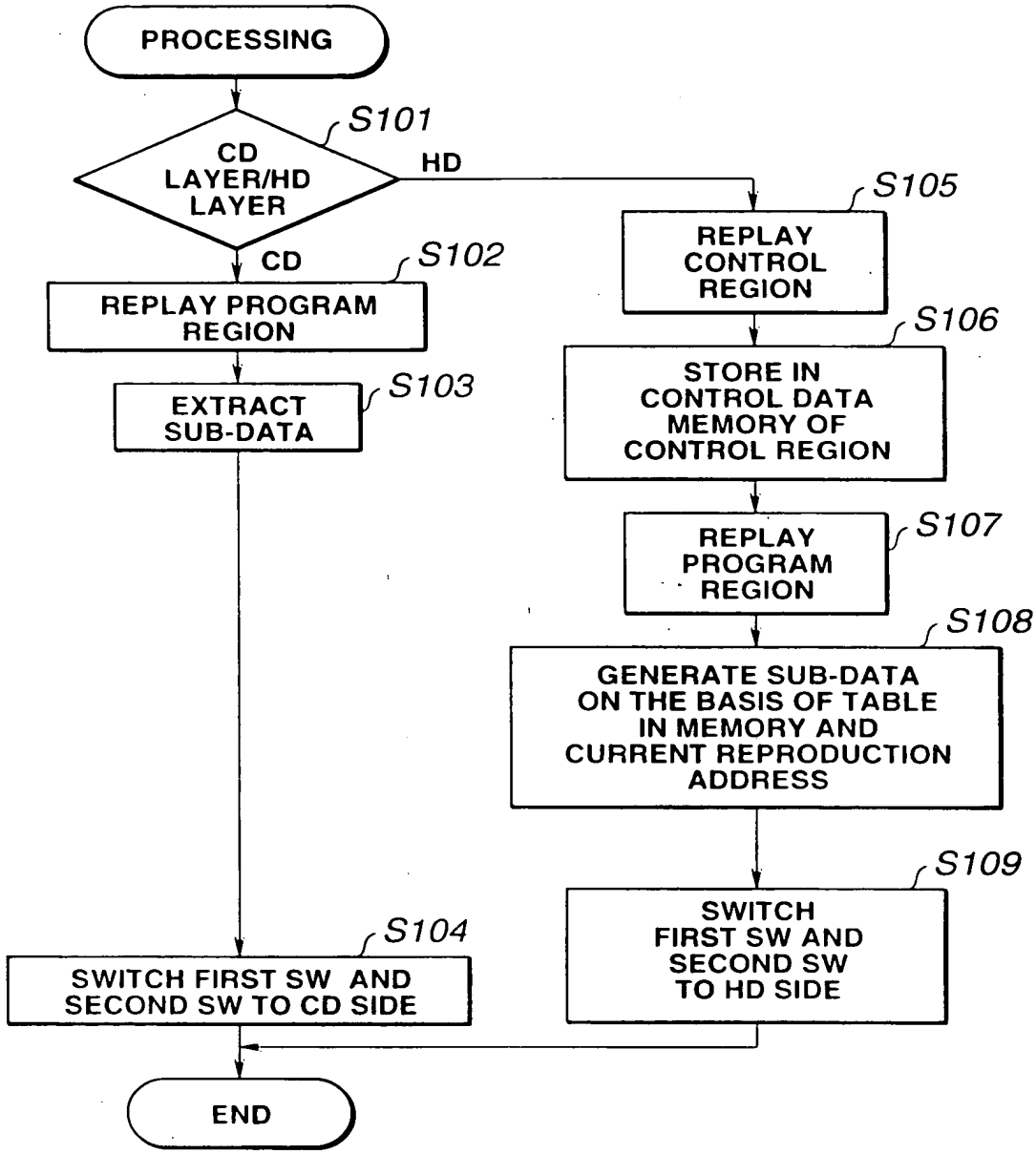

PROCESSING
S101
CD LAYER/HD LAYER
HD
CD
S102
REPLAY PROGRAM REGION
S103
EXTRACT SUB-DATA
S104
SWITCH FIRST SW AND SECOND SW TO CD SIDE
S105
REPLAY CONTROL REGION
S106
STORE IN CONTROL DATA MEMORY OF CONTROL REGION
S107
REPLAY PROGRAM REGION
S108
GENERATE SUB-DATA ON THE BASIS OF TABLE IN MEMORY AND CURRENT REPRODUCTION ADDRESS
S109
SWITCH FIRST SW AND SECOND SW TO HD SIDE
END

FIG.20